Washington Park Arboretum

BULLETIN

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Washington Park Arboretum

The Arboretum is a 230-acre dynamic garden of trees and shrubs, displaying internationally renowned collections of oaks, conifers, camellias, Japanese and other maples, hollies and a profusion of woody plants from the Pacific Northwest and around the world. Aesthetic enjoyment gracefully co-exists with science in this spectacular urban green space on the shores of Lake Washington. Visitors come to learn, explore, relax or reflect in Seattle's largest public garden.

The Washington Park Arboretum is managed cooperatively by the University of Washington Botanic Gardens and Seattle Parks and Recreation; the Arboretum Foundation is its major support organization.

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ABOVE: Just north of the Native Knoll in the Arboretum, the moss-covered trunk of a mature large-leaf maple frames the fall foliage of a young Japanese maple (*Acer palmatum* 'Kogane-sakae') in the distance. (Photo by Niall Dunne)

ON THE COVER: Fall color in the Woodland Garden at Washington Park Arboretum, late October, 2017.(Photo by Niall Dunne)

Crews from the Student Conservation Association helped kick off the Boulevard renewal project this summer.

Autumnal Anticipations

I love autumn. While I no longer get a 64-count box of new Crayolas each September, the anticipation of upcoming plans and adventures still kicks in with the same energy as in school years past. Here at the Arboretum, we are busily laying the groundwork not only for fall projects and events, but for the whole year ahead. Wondering what to expect? Here are a few highlights.

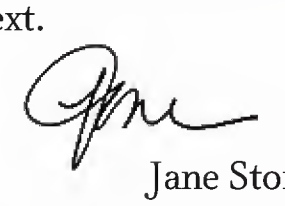
Out on the grounds, work is continuing on the Lake Washington Boulevard renewal project. Crews from the Student Conservation Association removed invasive plants from the western hillside this summer and laid down mulch in preparation for new plantings later this fall and next spring. This project, made possible by a generous friend of the Arboretum, will significantly improve areas adjacent to the new Loop Trail and shape the first impressions of the many drivers traversing the Arboretum each day. For starters, watch for enhancements to the Viburnum Collection and the vistas across from the Japanese Garden.

Our partners at Seattle Parks and Recreation have started preliminary planning for the refurbishment of the Waterfront Trail along Foster Island, which will happen in 2019. This will encompass the floating segments of the trail, as well as the adjacent entry from Foster Island. If you have walked the trail without your rubber boots during the rainy season, you will immediately understand the need for this work!

The Graham Visitors Center will also get some TLC in the form of an updated trellis surrounding three sides of the building. This work is slated to start later this winter, with special care taken to preserve the wonderful wisteria.

This year's Opening Night Party of the Northwest Flower and Garden Festival will be February 19, and our event team is busy plotting ways to top last year's sold-out affair. Our display garden crew is also working on concepts that will no doubt delight and inspire this year's festival audience.

I hope this gives you a feel for why I'm excited about what lays ahead of us. As we approach those magic days of fall color in the Arboretum and Seattle Japanese Garden, please come enjoy YOUR park and join us in planning and dreaming about what comes next.



Jane Stonecipher
Interim Director, Arboretum Foundation

A Touch of Bressingham

My Colorful Island Beds

Text by Barbara Blossom Ashmun
Photos by Doug Barragar

Shortly before I moved from a city lot to a sunny acre, I visited English gardens for inspiration. Bressingham Gardens, founded by Alan Bloom, was a highlight of that trip. With a huge weeping willow for backdrop, dozens of island beds glowed with color from perennials, many of them newly introduced by Bloom. I photographed madly and scribbled botanical names in a notebook. Spikes of pink and purple *Penstemon*, screaming orange *Kniphofia*, spires of blue *Campanula,* and domes of purple *Allium* were among the stars of that summer day.

Back home I contemplated my backyard—a huge stretch of field grass, mown into something resembling a lawn—and noticed a bald area roughly the size of an RV. Neighbors confirmed that, yes, the previous owner had parked an RV there. Hmmm. This could be my first island bed! I enlarged the space into a circle, applied a generous amount of compost, and started planting—*Delphinium*, *Penstemon*, *Veronica*, *Geranium*, *Dianthus*, *Lavatera*. I loved that island bed so much that I carved out another one each year until there were four.

For a while all those flowers were exciting, but eventually I realized color wasn't enough. No matter how many perennials I packed into

Purple-leafed *heuchera*, and other low-growing foliage plants, provide a frame for the author's island beds.

Blooming daylilies, *Agastache* and *Kniphofia* light up the island beds in summer time.

each island, three problems stared me in the face. Each island sat unmoored, floating in a sea of lawn. Also, as I walked around each perimeter, everything was visible; there were no hiding places for faded flowers or tattered leaves. And the edges of the islands were a mess, with billowing perennials spilling out onto the lawn where the mower and edger shredded them.

Anchoring the Island

Grounding the floating islands turned out be easy enough—once I added some ceramic ornaments. I discovered the solution accidentally, when an artist friend brought over some ceramic sculptures for an art show in the garden. Those standing figures within the islands helped anchor the beds. Later on, I bought ceramic birdbaths and large ceramic containers, placing their solid forms off-center in three of the islands for contrast with the softer-textured plants. A tall obelisk covered with dark purple *Clematis* 'Romantica' served the same purpose in the fourth island.

Selecting Tidier Plants

Tackling the messiness of spent foliage and faded flowers was more challenging. I took a hard look at the sloppier perennials and got tough, removing them in favor of those that looked good longer. For example, I love daylilies for masses of color in July, but a favorite—burgundy 'Strutter's Ball'—has foliage that rapidly bleaches. I replaced it with 'Bela Lugosi', which I found just as vivid, with leaves that stay fresh. Yellow-green 'Green Flutter', medium-yellow 'Butter Cream', and brilliant-yellow 'Self Propelled' are similarly well-behaved. I also removed *Campanula persicifolia*, as the spent flowers turned brown. I substituted *Veronica longifolia*, which offers sturdy stems covered with lilac-blue summer flowers, followed by green seedpods that are ornamental in their own right.

Framing the Island

Shapely leaves are especially important near the edge of a bed, preferably bearing upright flowers that won't get chopped off by the mower. Cultivars of *Heuchera* with colorful foliage make a handsome frame. Darker leaves are best for full sun, while golden ones need shade. Upright sedums like 'Matrona' and 'Touchdown Teak' have dark, succulent leaves that look great from the time they emerge in late spring until frost. I love 'Elsie's Gold' for its green, slightly jagged leaves with yellow-green centers, especially combined with yellow flowers.

A compact, golden-foliaged conifer in a ceramic container and *Clematis* 'Romantica' on an obelisk add height and help anchor the other plantings in this island bed.

With a good frame, masses of perennials with less interesting foliage and long-lasting flowers dress up the islands. Varieties of blue and purple *Salvia* (especially 'Black and Blue'); pink, orange and blue cultivars of *Agastache*; orange, yellow and red-orange *Kniphofia*; and red, pink and white hybrids of perennial *Hibiscus* make a splendid display.

A Few Final Discoveries

In the early years, I tried to include perennials for all seasons in the island beds, which gave me a long sequence of bloom, but only a smattering of color for each month. Since the islands were in the backyard and mostly enjoyed in summer and fall, I concentrated on perennials for those times. For a small winter lift, I planted dwarf conifers in the large ceramic pots within the islands.

As the islands filled out, I noticed that two were half in sun and half in shade. Daylilies on the shady side were leaning towards the sun, while hostas on the sunny side were burning. So I moved the hostas to the shady side, adding ferns and saxifrages to accompany them, and moved the daylilies to the sunny side, where they combined well with already existing *Coreopsis* and *Veronica*.

Gardening at its best is an ongoing experiment, as we try out various combinations and see how we like them. When I started my fourth island, I was feeling especially adventurous and chose three re-blooming 'Radway Sunrise' roses as the anchor plants. They're flamboyant—a blend of luminous orange and pink, much like the *Agastache* that accompany them. To balance out the heat, I planted blue *Agapanthus* and filled in with plenty of *Salvia* 'Black and Blue' and *Geranium* 'Rozanne'. It's my favorite place to sit and watch the hummingbirds, butterflies and bees flit from flower to flower.

I'm so glad that my first trip to England included that life-changing visit to Bressingham. Allan Bloom passed away in 2005 at the age of 99, but he lives on in my garden.

Barbara Blossom Ashmun has written seven gardening books, most recently "Love Letters to My Garden," a collection of essays about the joys and wonders, disappointments and transformations that color a gardener's life. She wrote a column for the "Portland Tribune" from 2004 through 2011 and was a contributing editor for "Fine Gardening" for many years. Her essays have appeared in "GreenPrints," "Pacific Horticulture," the "Chicken Soup" series, and "Women Reinvented."

HIDDEN TREASURE OF THE ARBORETUM

The stunning fall foliage.

Japanese Rowan

By Niall Dunne

Last year was a banner year for fall color, and I took a lot of photos in the Arboretum. One of the most striking foliage displays I encountered was on a small Japanese rowan (*Sorbus commixta*) in the Brian Mulligan Sorbus Collection. It was mid-October, and the glossy, fern-like foliage of the young tree was turning from green to a gorgeous mix of orange-red and deep purple. Later, I looked through my photo archives and found that (over the years) I had photographed the same plant in flower and fruit—and I liked what I saw.

Creamy white flower clusters in May.

Maturing fruit in summer.

FABULOUS IN ALL SEASONS

Sorbus commixta is a deciduous shrub or small tree in the rose family (Rosaceae) native to mountain forests in Japan, Korea and the Russian Far East. The plant's form (and other features) can vary considerably over its native range, but generally it starts out somewhat columnar and matures into a broader, more rounded tree between 20 and 30 feet high. The compound leaves grow up to a foot long and consist of between 13 and 17 sharply pointed leaflets, with serrated edges arrayed on either side of a central stalk. In autumn, the foliage turns yellow to purplish red. "The Hillier Manual of Trees & Shrubs" (David and Charles, 1996) says Japanese rowan is one of the best *Sorbus* for fall color.

It also has handsome, big blooms and colorful, berry-like fruits. Around mid-May, small, five-petalled, creamy-white flowers are held in six-inch-wide, flat-topped clusters above the foliage. These develop into large, erect bunches of small, red to orange-red (sometimes yellow) fruits. The fruits persist until late in the season and provide a banquet for birds. The smooth, silvery-gray bark also is decorative and becomes fissured as the tree reaches old age.

The ethnobotany of *Sorbus commixta* is interesting. Traditionally, the fruits have been eaten as food, and have also been used medicinally as a gargle for sore throats and a laxative. The cortex of the plant has been used to treat bronchitis, gastritis and dropsy. Researchers in Korea have recently been exploring the plant's biological activity and its potential for treating inflammation and certain types of cancer. Do note, however, that the seeds contain hydrogen cyanide, which can be harmful if consumed in excess.

ARBORETUM HISTORICAL RECORD

The tree I photographed in the Arboretum last fall was a gift from Dan Hinkley and Heronswood Nursery. Dan gave it to us as a seed in 1994, and it was planted out in 1998, originally in the north corner of the Visitors Center parking lot. In 1999, the specimen was moved to the middle of the Sorbus Collection, located on the east side of Arboretum Drive, just across from the Magnolia Collection.

When I researched this article, I found out that there are actually 10 specimens of Japanese rowan in the Sorbus Collection—and their historical records provide a wonderful example of the collaborative work done by public gardens around the world. The oldest dates back to 1945 and came to us from the Royal Botanic Garden Edinburgh, Scotland. Other specimens, dating to the 1950s, came from the Essen Botanical Garden, Germany; the Arboretum in Wageningen, Holland; the Hortus Botanicus in Poznań, Poland; and the Experimental Forest Station, at Kyoto University, in Kyoto, Japan.

Many of these specimens had been planted in various spots around the Arboretum and were then consolidated into the Sorbus area when that collection was renovated in the late 1980s. (The collection was dedicated to former Arboretum director—and *Sorbus* enthusiast—Brian Mulligan in the summer of 1990.)

I became curious as to why—with such a great variety of species in the Arboretum's Sorbus Collection—Japanese rowan is so numerically dominant. Was it Brian's favorite? I asked UW Botanic Gardens' Curator of Living Collections Ray Larson if he could shed any light.

VARIATION: THE SPICE OF PLANT LIFE

"As to why *Sorbus commixta* is so well-represented in the collection," says Ray, "I would surmise that it is for a few reasons. One is because the species is a rather variable tree in terms of berry color, with forms selected for yellowish to orange to bright-red fruit, and gradations in between. Second is the fact that it is a generally a smaller, more compact tree than many others in the genus. This makes it a great tree for small- to medium-sized gardens, and allows us at the Arboretum to showcase a lot of variety within a relatively small space. Third, it really is one of the better species in terms of overall effect, from size to berry color to fall foliage."

"Another reason we have so many," continues Ray, "is that several of the plants we received over the years originally came with different names attached but were later reclassified as *Sorbus commixta*. *Sorbus* was of special interest to Brian Mulligan, and he was very much on top of the nomenclature and literature on the genus."

Variation is strong within this species—so much so that it's captured in the species name, *commixta*, which is Latin for "mixed together." And where there's variation, there can be taxonomic confusion and disagreement. In his "North American Landscape Trees" (Ten Speed Press, 1996), Arthur Lee Jacobson writes "[The tree] is variable, and its name *commixta* likely refers to the consternation of botanists attempting to delineate its proper place in the cosmos."

I'll be heading out to the Sorbus Collection again with my camera this fall to see if I can capture some of that variation. I'm curious about a yellow-fruiting variety of *S. commixta* that Brian Mulligan donated from his home garden in Kirkland, in 1990. (The seed of the plant originally came from a nursery in Aviemore, Scotland, in the early 1970s.) Situated at the north end of the collection, it doesn't have any special cultivar name, but I'm betting it's a pretty special plant.

Niall Dunne is the editor of the "Bulletin" and the communications manager at the Arboretum Foundation.

GROWING TIPS

Most *Sorbus* thrive in the maritime Pacific Northwest, and Japanese rowan is no exception. It does best in moist, well-drained, acid-to-neutral soil, in full sun or light, dappled shade. Propagation is done by sowing seed in containers in a cold frame in fall or by taking cuttings in early summer.

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A blend of medium and fine textures, including *Salvia officinalis* 'Berggarten', *Pittosporum tenuifolium* 'Golf Ball', *Coreopsis verticillata* 'Zagreb', and two alliums (*Allium christophii* and *Allium sphaerocephalum*).

Texture in the Garden

TEXT AND PHOTOS BY JANINE ANDERSON

Texture in the garden is rather like art: It can be hard to explain or define, but we recognize it when we see it. And why is garden texture tricky to describe? Most likely because it's created by a complex blend of factors—the dynamics of light, foliage variation, distance from the viewer, and more.

What Is Texture?

Put simply, texture is the surface quality of an object. Most often, texture in the garden is experienced visually. Variation in light, shadow and color on smooth and unsmooth surfaces generates gradations of texture. Differences in the size, shape (regular or irregular) and surfaces (shiny or dull) of individual leaves also play a large role.

The arrangement of leaves on branch stems contributes to our interpretation of texture, as does the density of the branches and the general growth habit of each plant.

How we perceive texture also depends on how near or distant we are from it. For instance, up close, a small-needled conifer seems finely textured—but step back, and the needles coalesce into a solid, coarsely textured form.

Texture changes with the seasons—as plants leaf out, produce flowers, set fruit, and disperse seeds. Deciduous trees drop leaves, and entirely new textures emerge as branches and bark become visible. Some plants become more prominent in winter, while others seem to disappear into the background.

THIS PAGE TOP

Coarsely textured tree peony (*Paeonia suffruticosa* 'Hai Huang'), underplanted with finely textured fountain grass (*Pennisetum alopecuroides* 'Little Bunny') and a groundcover of woolly thyme (*Thymus pseudolanuginosus*).

BOTTOM

Finely textured Tasmanian tree fern (*Dicksonia antartica*), Japanese forest grass (*Hakonechloa macra* 'All Gold'), and coarsely textured × *Fatshedera lizei* 'Aureo Maculata' contribute to the textural drama of this planting.

Categories of Texture

Visual textures are usually categorized as fine, medium or coarse.

Finely textured plants often have many small leaves, flowers and branches. They reflect many small patches of light and shadow, and by doing so can make a space feel larger. They tend to recede into the background and showcase bolder-textured plants.

Finely textured plants create more of a sense of enclosure than do coarsely textured plants. They can feel, look, and even act like a wall. That said, they can also add dimension to a solid partition: A vine growing on a concrete wall texturizes the wall and adds depth to a garden.

Plants with leaves that are compound (see *Sorbus commixta*, page 6), dissected, lobed, variegated, ridged or shiny are usually considered finely textured. So, too, are plants with leaves regularly spaced along their stems or with foliage that has contrasting light undersides.

Fine texture also may result when flowers or fruits break up the regular pattern of the leaves. Movement can also can also interrupt a regular pattern. For example, ornamental grasses provide a finer texture when swaying in a breeze than they do when still.

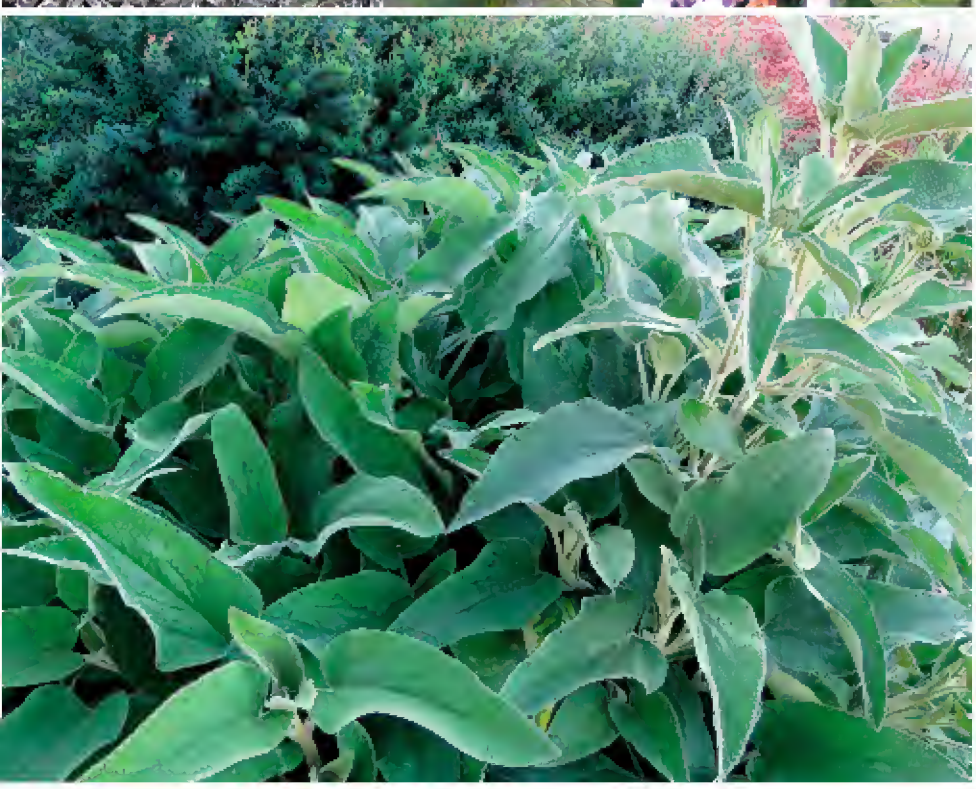
Examples of finely textured plants include ferns, grasses, boxwoods (such as *Buxus sempervirens*), and other small-leaved plants like *Azara microphylla*, *Prostanthera cuneata*, and some varieties of *Pittosporum tenuifolium* (such as 'Golf Ball'). A lawn creates a finely textured, sensual surface beneath our feet.

Coarsely textured plants are bold (many gardeners say "bold" instead of "coarse"), highly visible, and hard to ignore. Many tropical plants have coarse textures: They have large leaves; thick, massive branches; and loose growth habits (you can see through them).

Coarsely textured plants are the first plants you notice when you enter a garden, and they impart strength and stability to a design. In a large space, coarsely textured plants can make an area seem smaller and more intimate. However, it pays to use coarsely textured plants in moderation; otherwise, they can be overwhelming or lose impact.

Coarsely textured plants are associated with less formal landscapes. Examples include many hydrangeas, magnolias, catalpas, hostas, gunnera and fatsia.

Between fine and coarse texture is medium texture, where leaf size and branches are neither small nor large, and the plant's silhouette is tighter than that of more coarsely textured



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Coarsely textured *Hydrangea aspera* var. *sargentiana* against a backdrop of finely textured *Pittosporum tenuifolium* 'Marjory Channon' and *Clematis recta* 'Purpurea'.

BOTTOM

Dense, dark, finely textured evergreen barberry (*Berberis buxifolia* 'Nana') creates a backdrop for coarsely textured Jerusalem sage (*Phlomis russeliana*).

flora. Examples include *Viburnum tinus* 'Spring Bouquet', *Arbutus unedo* and *Pieris japonica*.

Texture and Tactility

Texture in the garden can also be interpreted literally—that is, by the way something feels. We know from experience that lamb's ear (*Stachys byzantina*) is soft and smooth (like a lamb's ear), and we can experience the sensory pleasure it provides without even touching it. Fuzzy, stiff, prickly, rough, smooth and soft are some of the adjectives that describe the tactile nature of a plant's texture.

Interesting textural plants that encourage the sense of touch are an important component of sensory gardens designed for people with visual impairments.

What Does Texture Do?

When selecting plants, think about visual texture, and it will help you increase the aesthetic appeal of your garden. Texture can be used to create both unity and variety in your design, and to enhance the color palette. As discussed, it can also make a small garden seem larger or a large garden feel cozier.

Unlike with color, which can captivate even when the palette is monochromatic, a landscape filled with similarly textured plants generally is not very exciting. Contrasting textures add drama to a garden.

How much drama to add? That's usually a matter of personal taste. Too much textural contrast may make your garden seem too busy, and some designers recommend ratios of finely-textured to coarsely textured plants in a bed. But I recommend that you experiment to find a balance that works for you.

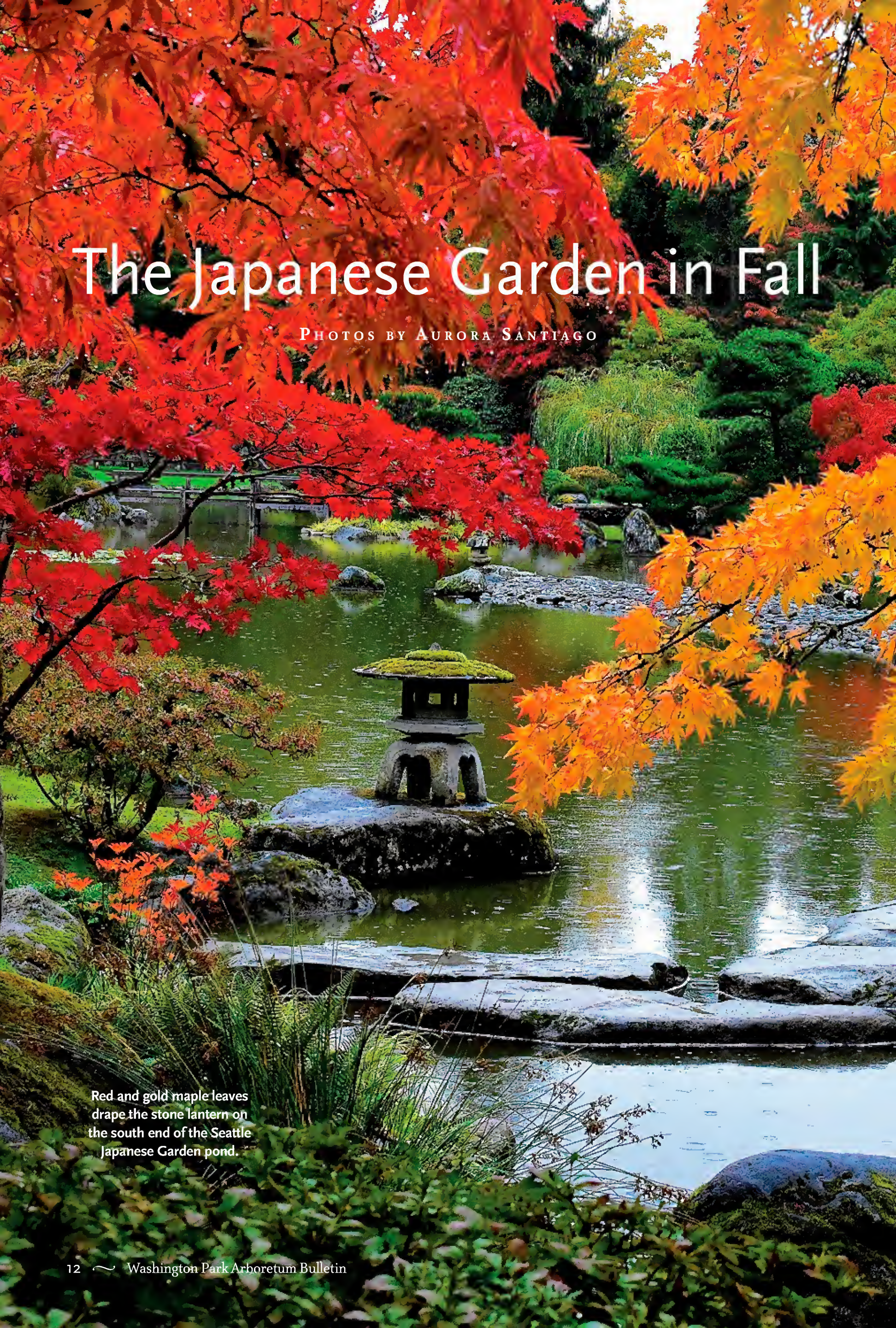
Janine Anderson, CPH, is an award-winning Pacific Northwest-based landscape designer (www.northbeachlandscapes.com), garden writer, speaker, and member of the "Bulletin" Editorial Board.

Acknowledgements

I would like to credit Polly Hankin, my landscape design instructor in the Horticulture Program at Edmonds Community College. Thanks to Polly's stellar instruction, my class notes are still relevant 18 years later!

The Japanese Garden in Fall

Photos by Aurora Santiago

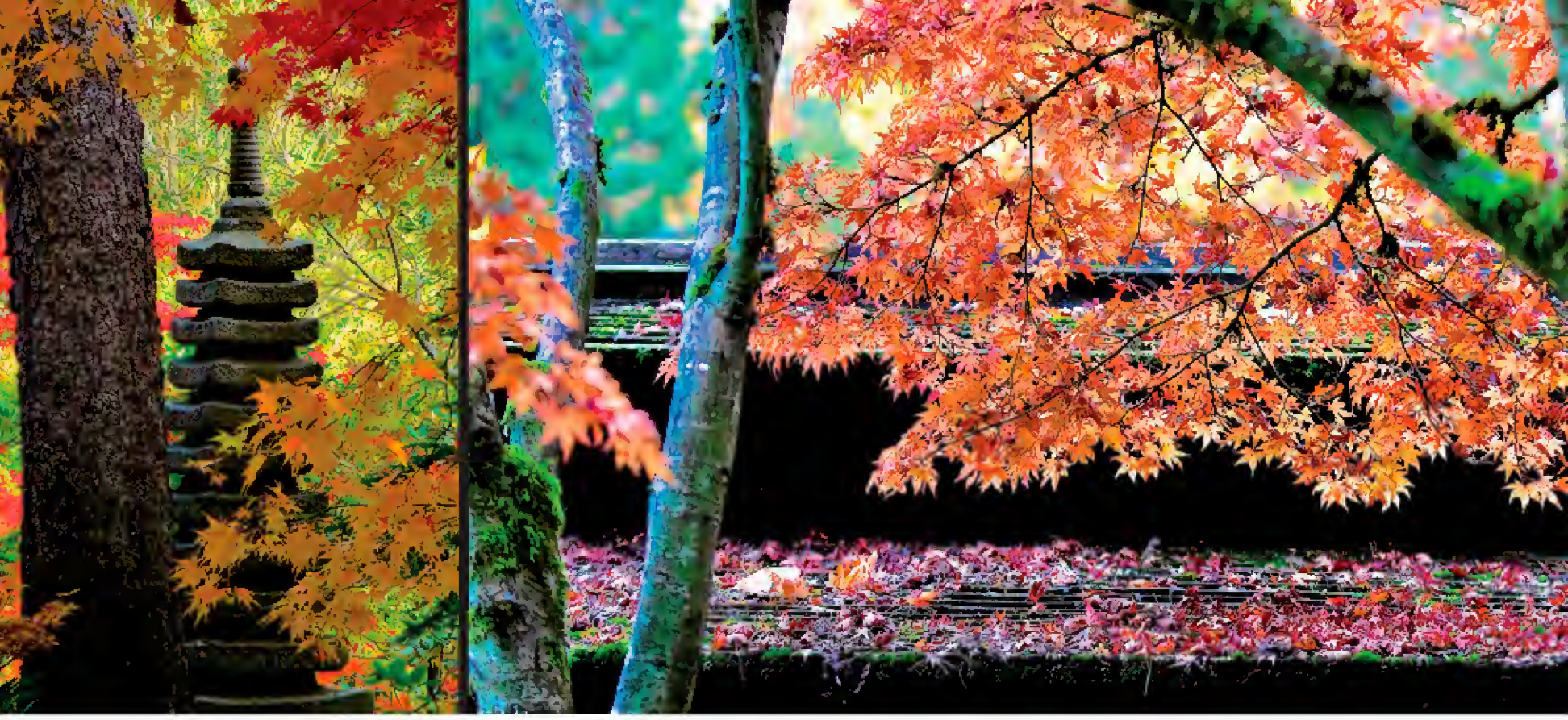


Red and gold maple leaves drape the stone lantern on the south end of the Seattle Japanese Garden pond.

TOP RIGHT: A Kasuga-style lantern and stone bridge mark the path to the Garden's maple-and-evergreen-covered "mountainside."

CENTER RIGHT: A maple tree frames the rocky cape and stone lantern on the east side of the pond.

BOTTOM RIGHT: Looking south over the pond, golden ginkgoes, fiery maples and evergreens form a backdrop to the zig-zag bridge.



LEFT: Tucked up on the mountainside, this 11-tiered pagoda represents monasteries in the mountains of Japan.

RIGHT: Maple leaves cover the roof of the machiai house in the tea garden.

Aurora Santiago is a nature and garden photographer whose work is strongly featured on the Seattle Japanese Garden website and blog. She won the People's Choice Award during the 2017 "Autumn Reflections" juried photo exhibit at the Japanese Garden. She is also a retired RN.

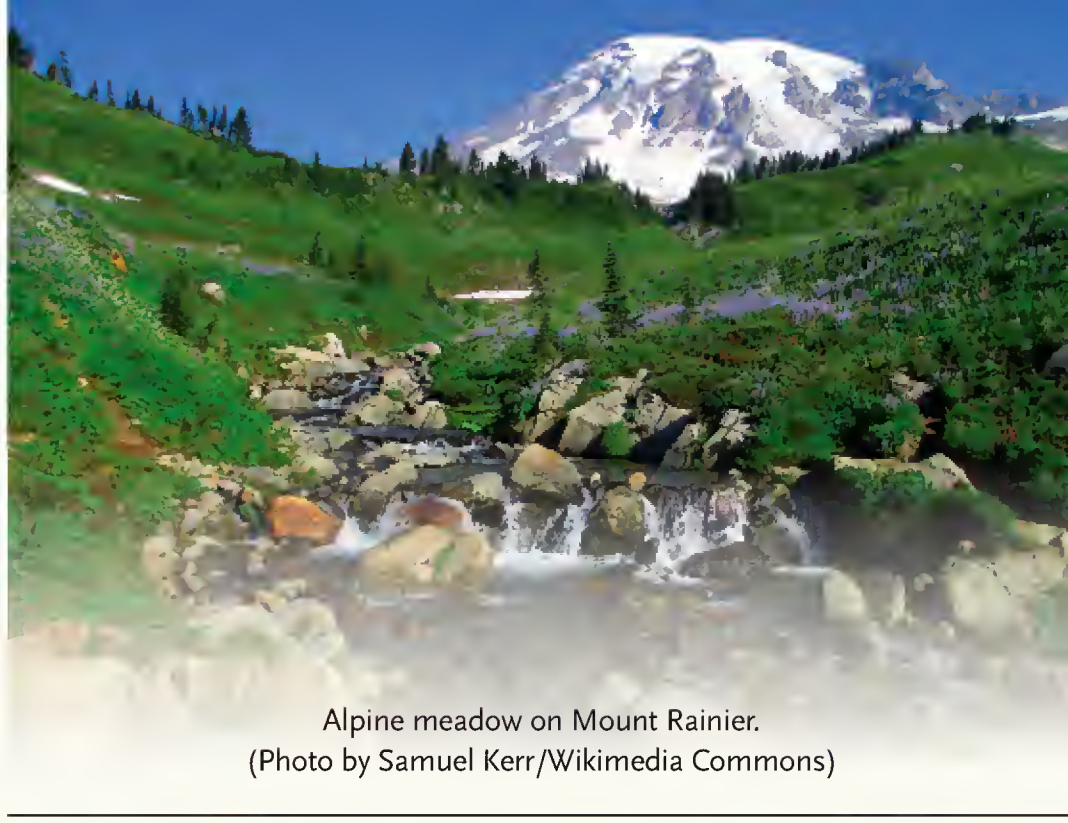
PROJECTED ENVIRONMENTAL CHANGES IN THE PNW

- Rise of between 2.7°F and 10.4°F in mean air temperature this century, with greatest warming occurring in summer.
- Reduction in summer precipitation of up to 14% by end of century.
- Increase in mean winter precipitation of up to 8% by end of century.
- Summer soil-water availability likely to decline in much of region.
- This will lead to increased drought stress and reduced photosynthesis.
- Less precipitation will fall as snow, leading to reduced snowpack accumulation and duration, and subsequent impacts on dependent ecosystems.
- Warming winter temperature may lengthen growing season, promoting growth (given sufficient water).
- However, warmer winters may fail to satisfy "chilling requirement" of some species (e.g. Douglas-fir)—leading to delayed budburst and shoot growth.
- Also, early budburst may expose plants to potential frost damage.
- Early flowering may promote seed production but also lower reproductive capacity by altering synchrony between plants and their pollinators/dispersers.
- Elevated carbon dioxide in the air may enhance productivity and water-use efficiency in plants, offsetting somewhat the negative effects of warming.
- Warming climate will likely increase disturbances from wildfires, new pests and diseases, and invasive species.
- This may cause forests to convert from carbon sinks to carbon sources.

OUR CHANGING CLIMATE, PART 3

Implications *for* Native Plant Communities *and* Conservation *in the* Pacific Northwest

By Niall Dunne



Alpine meadow on Mount Rainier.
(Photo by Samuel Kerr/Wikimedia Commons)

Part 1 of this article ("Bulletin," Fall 2015) discussed simple practices that gardeners can adopt in order to shrink their carbon footprint and help reduce the severity of climate change in our region. Part 2 ("Bulletin," Fall 2016) offered tips on how to adapt the garden to the coming conditions, which include hotter, drier summers; warmer, wetter winters; and new pest and disease problems (see "Projected Environmental Changes in the PNW," page 14). Part 3 explores the predicted effects of climate change on native plant communities in our region and the steps that land managers are taking to prepare.

ASSESSING VULNERABILITY

A few years ago, I went on a day trip to the Olympic Peninsula on behalf of the UW Botanic Gardens' Rare Care Program. The assignment was to find and survey a small population of golden chinquapin (*Chrysolepis chrysophylla*), a native tree in the beech family with leathery, evergreen leaves and spiny, chestnut-like fruits. The tree is relatively common in the coastal forests of Oregon and California, but only occurs in several small, scattered populations in Washington—the northernmost point of its current range.

It took some scrambling across a steep, forested ridge, but eventually my field partner and I found the trees—about eight of them. They were somewhat isolated from each other in a sea of western hemlock and Douglas-fir—and they didn't look particularly healthy. (The species is relatively intolerant of shade.) It was hard to imagine how this tiny population could persist over time. However, it's possible we may be hearing more from the species in the future. According to a 2012 USDA Forest Service report entitled "Climate Change and Forest Trees in the Pacific Northwest," "tree species that are highly drought-tolerant (e.g. Pacific madrone, golden chinquapin and Rocky Mountain juniper) may become more competitive in areas presently dominated by less drought-tolerant tree species."

The report assesses the vulnerability of regionally native tree species to climate change based on a number of factors, including their current distribution, adaptive genetic variation, reproductive capacity, and threats from insects and disease. In the Western Washington region, iconic forest species such as Douglas-fir, western red cedar, bigleaf maple and western hemlock all scored relatively low—meaning that they are at least risk from climate change effects. The highest vulnerability scores went to Pacific silver fir, subalpine fir, Engelmann spruce, noble fir and grand fir, which all happen to be cold-adapted, high-elevation tree species. (The report recommended that these species become a special focus for conservation and monitoring efforts.)

This tracks with general predictions about the influence of climate change on forests—namely that forest communities are expected to lose cold-adapted trees near their low-elevation and low-latitude range limits, while warm-adapted trees are expected to increase in abundance near their high-elevation and high-latitude limits.

SPECIAL CONCERN FOR ALPINES

The concern for cold-adapted trees is echoed in a more recent Forest Service publication, "Climate Change Effects on Vegetation in the Pacific Northwest" (2014), which reviews and synthesizes the current scientific literature and ecosystem modelling projections on the topic. The authors found that of the five major biomes in the Pacific Northwest (subalpine forests and alpine meadows; maritime, coniferous forests; dry coniferous forests; juniper savannas and woodlands; interior shrub-steppe), subalpine forest and alpine meadows are at most risk. All the simulation models reviewed agreed that suitable climate available for most key subalpine species will be moderately reduced to nonexistent by the end of this century. Suitable habitat may only be available at high elevations in the far northern Cascade Mountains.

While many members of these high-elevation communities will likely be able to persist farther north of our region (either because they grow there already, or they may be able to migrate), some endemic alpine species—that is native alpines restricted to our region—may be in big trouble.

At the UW Botanic Gardens' 2018 Washington Botanical Symposium in March, Eric DeChaine, professor of biology at Western Washington University, presented his lab's research on five perennial herbs endemic to the Olympic Mountains: piper's harebell (*Campanula piperi*), Flett's violet (*Viola flettii*), Olympic Mountain groundsel (*Senecio neowebsteri*), Olympic Mountain synthyris (*Synthyris pinnatifida* var. *lanuginosa*), and Flett's fleabane (*Erigeron flettii*). DeChaine and his graduate student Samuel Wershow have estimated that 85 to 99 percent of suitable habitat will be lost for each of the species by 2080—and that small refugia (areas in which populations may persist as warming diminishes their habitats elsewhere) may only remain on the highest peaks of the eastern Olympics.

In a related paper published this spring in the "American Journal of Botany," Wershow and DeChaine write that all five species are habitat specialists occupying a narrow range of environmental conditions—generally the cold, rocky terrain on the snowy edge of the high alpine zone. "As temperatures warm and precipitation at high elevations shifts from snow to rain, these climate conditions will cease to exist. The endemics have essentially topped out; they are already occupying the highest and coldest available terrain, and there is no colder climate space available for their distributions to shift into as climate warms."

For a plan of action, the researchers recommend that potential refuge sites (some of which are mapped in their paper) be protected from non-climate related impacts, such as hiking by humans and foraging by non-native mountain goats. (Good news on the latter score: Olympic National Park officials began airlifting mountain goats back to their native range in the North Cascades this summer.)

So-called "interventionist" approaches, such as assisted migration (moving the plants to more favorable habitat), may also be helpful. However, Wershow and DeChaine say that these approaches are controversial due to their potential unintended effects on other native species and are unlikely to be used in the Park because it is managed as wilderness.

OBSERVATIONAL STUDIES

Though the different ecosystem models seem to be in relative agreement about the vulnerability of alpine and subalpine communities, there's a lot of uncertainty about the other major biomes in our region. This stems from a lack of certitude about exactly what future growing conditions will look like (particularly precipitation levels), and also how plants will respond to the changes. For instance, some model results predict little or no change for maritime coniferous forests, while others predict reductions for this forest type—particularly in the southern part of the Pacific Northwest.

Models use simplified versions of natural systems and are best utilized as signposts rather than definitive forecasts. Other data, such as results from observational and experimental studies, should be factored in, too. One 2010 study of forest herb communities in the Siskiyou Mountains of southern Oregon was consistent with warming predictions: It found that, over a 60-year period (1949 to 2009), in which mean temperatures increased 3.5 °F, there were

multiple changes in lower montane communities consistent with an effectively drier climate—including a reduction in plant leaf size and the presence of more plants from southerly climes.

The results of a similar, though shorter-term, 2015 study led by UW biology professor Janneke Hille Ris Lambers were not so clear cut, however. Her team examined the change in composition of six, old-growth stands of high-elevation forest at Mount Rainier National Park over the past 35 years in response to warming climate (mean temperatures have gone up 1.2 °F in the wider region since the 1900s). They didn't find much change in the overstory at all. However, they warned against interpreting the results as a sign that our forests are resilient to climate change. Instead they write about how changes in forest composition can lag behind changes in climate, due to the persistence of cold-adapted species (despite warming) and the limited ability of warm-adapted species to expand their ranges upward (despite newly suitable habitat)—it can take many years for trees at their upper range limits to mature and produce seed.

They also speculate that warming on Rainier may not have been as severe as the regional average. Projections for future climate change in our region are five to seven times greater than those observed in the last century—so it may just be a matter of time before we start seeing higher tree mortality and compositional turnover.

MANAGING FOR UNCERTAINTY

Plant migration can be a very slow process. Because weather patterns change from year to year, plants have a lot of built-in adaptability, and trees can potentially survive for decades, even while severely stressed. They can also adapt to new climate conditions through generational evolution. The more variability in the genome of a species, the more likely that natural selection will produce offspring adapted to the changes.

Because of this, a lot of plant scientists think that major changes in our forests and other biomes will probably come about because of indirect effects of climate change—in particular major disturbances, such as wild fires and insect infestations. Climate change-related stress, such as drought, makes ecosystems more vulnerable to these disturbances. Fire and pests can eliminate weakened adult trees, providing opportunities for new species to move in—including invasive exotic plants, which are expected to become even more competitive as our climate warms up.

Higher year-round temperatures and decreased precipitation are already allowing pathogens to expand their ranges and growth rates in the western U.S. For instance, climate change is linked to large-scale destruction of forest by pine beetles in British Columbia, cytospora canker attacking thinleaf alders in the southern Rocky Mountains, and infestation of piñon and ponderosa pines by ips beetles in the Southwest.

Land managers in the Forest Service are being encouraged to prepare for such disturbances using a toolkit of "no regrets" approaches. These include maintaining and increasing biodiversity to make forests more resilient to drought and pests—if one species falls, there are others to fill the breach. Fire hazards can be reduced by such practices as prescribed burns and increasing tree diversity. Addressing existing problems, such as removing invasives, and restoring healthy native communities, can help mitigate future problems—even if it's unclear what these problems will be.

Monitoring will play a critical role, as scientists try to detect changes in plant species growth, reproduction, and mortality, and then figure out how to respond. Connecting the landscape through ecological restoration will be critical, too, to help plants disperse—once they start to move. We may have to become more flexible about restoring strict historical conditions, however. (The traditional goal of ecological restoration has been to restore plant communities to their pre-Columbian condition.) Species have varying degrees of tolerance for climate change, so when they do migrate, they will do so individually. In other words, climate change may produce novel vegetation communities. Our new forests may not look like the ones that colonial Americans encountered, but we can hope they will be healthy forests nonetheless.

Niall Dunne is the editor of the "Bulletin" and the communications manager for the Arboretum Foundation.

Rewarding *Ruscus*

Handsome Evergreen Plants for Shade or Sun

By Walt Bubelis

I've always been fascinated by *Ruscus aculeatus*—a small, bushy, evergreen shrub from Southern Europe. Its common name is butcher's broom, so called because in the Middle Ages—and beyond—the plant's mature branches were bundled and used by butchers to clean their cutting boards. The stems are strong, and the "leaves" (actually cladodes, but more on that below) are very stiff and prickly, which presumably made them good for scouring the cutting surfaces clean. What's more, the plant's essential oils may have provided antibacterial benefits. (The shoots and rhizomes of *R. aculeatus* have been used since ancient times to treat all sorts of ailments, from hemorrhoids to poor blood circulation.)

I've had a butcher's broom in my own garden since 1978, when Mike Fleming—then the newly appointed grounds manager of the Hiram M. Chittenden Locks—gave me a seedling. At that time, *Ruscus* was placed in the Liliaceae family—another fact that amazed me. It has since been assigned to the Asparagaceae, which makes more sense because the new growth of the plants resembles the spears of asparagus and can be eaten in a similar fashion (though the flavor is reportedly more bitter).

Over the years, my little seedling grew to a height of three feet and slowly sent out underground rhizomes in an ever-enlarging circle, eventually reaching some four feet wide. I've since divided the plant twice.

What a Real Leaf!

The upright, branched stems of butcher's broom are relatively short-lived, but the plant sends up new ones annually. (I just trim out the dead shoots each spring.) Its small, elliptical, glossy, spiny-tipped "leaves" are actually expanded, flattened portions of the stem, technically termed cladodes or phylloclades. Like leaves, they are photosynthetic and use the sun's energy to make food for the plant. (Developmental studies actually suggest that cladodes are neither branches nor leaves but intermediate between the two.)

Ruscus aculeatus does produce a true leaf—an exceedingly small, papery, scale-like one on the midrib of the upper surface of each cladode. And it's non-photosynthetic. Tiny, whitish or light-green flowers with violet centers appear under the leaves in spring, but you need a magnifying glass to appreciate them. You won't fail, however, to notice the plump, brilliant-red berries that develop from the flowers on female plants in summer and are held on the plant through fall.

I waited some years for my plant to produce fruit, only to discover that it is a male. Until I can find a labeled female to grow as a companion, I will continue to just enjoy the foliage traits of this excellent ground cover, not to mention its remarkable adaptability. *Ruscus aculeatus* grows in a variety of habitats in its native range, including woodlands, hedgerows and coastal cliffs. As a result, it adapts well to sunny and shady spots in the garden, and can even tolerate dense, dry shade.

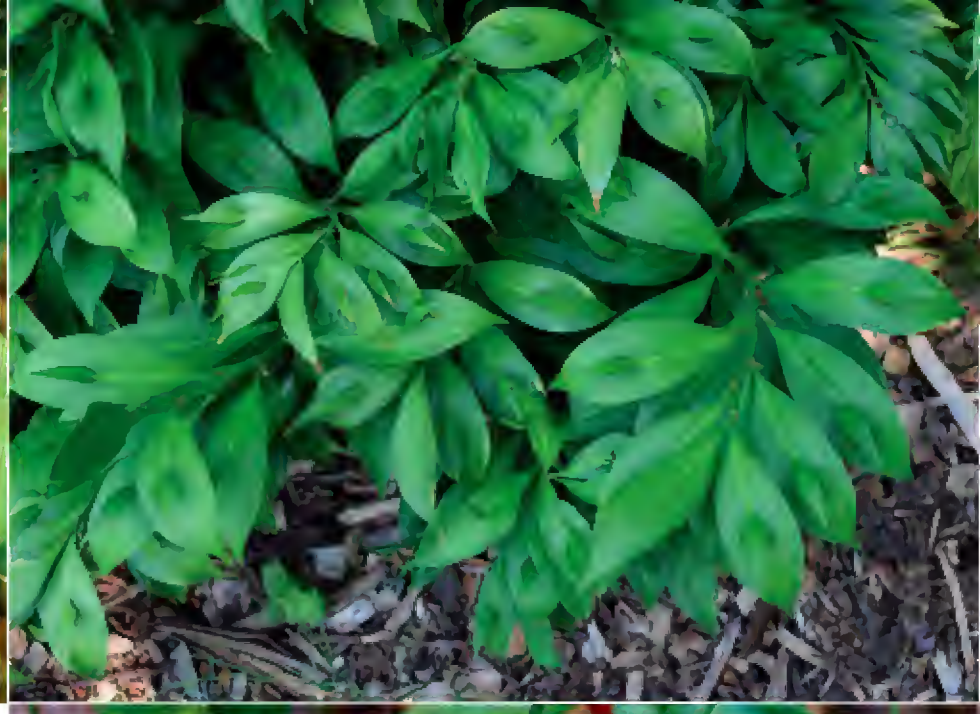
Ruscus aculeatus 'John Redmond'. (Photo by Dominicus Johannes Bergsma/ Wikimedia Commons)

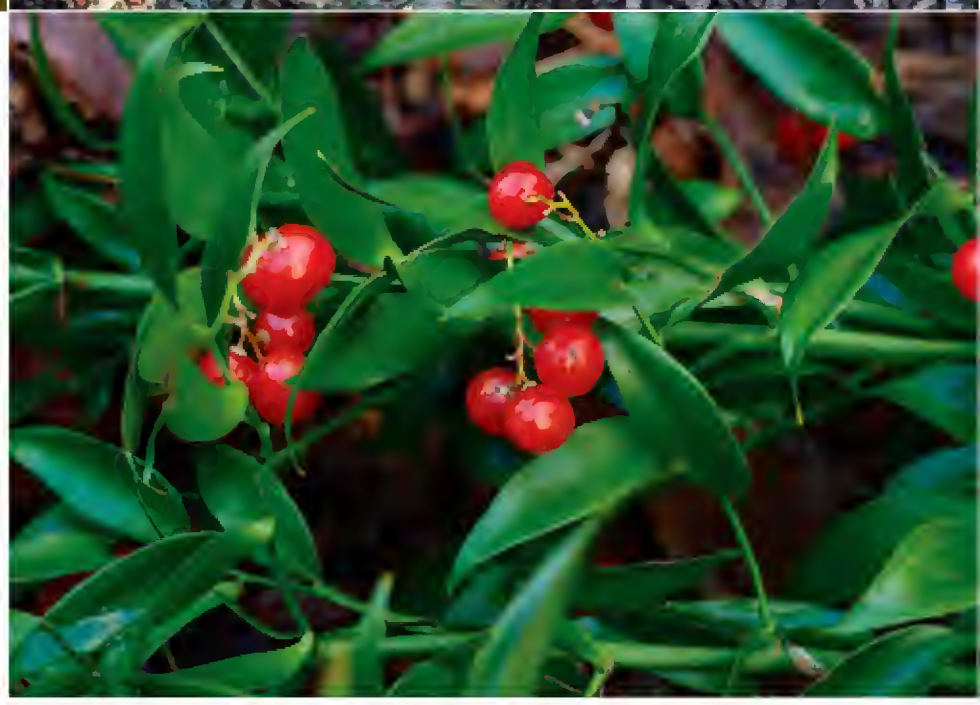
Ruscus hypoglossum in the Woodland Garden at the Arboretum. (Photo by Niall Dunne)

A Look at the Genus

Altogether, there are six species in the genus *Ruscus*, native from western Europe east to the Caucasus region and south to northwest Africa. Like butcher's broom, they are all rhizomatous, low-growing, shade-tolerant evergreen subshrubs (small shrubs) bearing numerous cladodes on their upper stems; minute, scale-like leaves on their cladodes; pretty but tiny flowers; and decorative, bright-red fall fruits. Unlike butcher's broom, they don't all have branching stems, and they are not all dioecious—some are monoecious, meaning they carry male and female flowers on the same plant.

A dioecious species with much broader cladodes than butcher's broom is *Ruscus hypoglossum*. It also comes without the spiny tips and has arching, unbranched stems! You'll find some lovely, thick clumps of this plant in the bed on the south end of the Witt Winter Garden at the Arboretum, as well as in the Woodland Garden, by the path on the south side of the upper pond. (Our specimens date to 1949 and came to us from the Hortus Botanicus in Zagreb, Croatia.)





Ruscus hypoglossum typically grows 18 inches high and three feet wide. Common names include horse tongue lily, mouse thorn, and thornless butcher's broom. Growing wild from Italy north to Austria and east to Iran, the plant is supposedly the one Julius Caesar used for his "laurel" crown. The dwarf selection 'Mr. Lonely' is a male clone that grows up to just 15 inches high.

Another spine-free dioecious species is Spanish butcher's broom, *Ruscus hypophyllum*, native from southern Spain to northwest Africa. It grows up to two feet high and three feet wide and produces large, luxurious, shiny, deep-green cladodes on upright, unbranching stems. The stems are very popular in the floral trade as a filler. (In the U.S., major commercial production of the plant takes place in Florida.) The cut stems can remain vibrant for up to five months.

Ruscus ×*microglossus*, a presumed natural hybrid between *R. hypoglossum* and *R. hypophyllum* first described in 1855, is now in the local trade. It is short, like *R. hypoglossum*, but its cladodes are longer—as well as more slender and spaced along the stem—than those of either parent. It can form large, suckering thickets of erect or arching stems. In the main central bed of the Winter Garden, you'll find three clumps of *Ruscus*. Originally accessioned as *R. hypoglossum*, they are much closer in appearance to *R.* × *microglossus*. The Arboretum's horticultural staff is working to pin down the identity of these plants.

Three other species of *Ruscus* exist, some in very limited ranges, such as Madeira and Azerbaijan. Of these, only *R. colchicus*, from Turkey and the Western Caucacus, is well known (though still rare) in cultivation. The foliage is large, thick and glossy, and the flowers and fruit are produced on the undersides of the cladodes.

Don't Forget *Danae*

Self-fertile varieties of *R. aculeatus* are available, producing fruits without the need of a nearby male. 'Wheeler's Variety' is a small, erect shrub that boasts striking, large red berries. 'John Redmond' PBR is a compact dwarf selection with glossy red berries. Non self-fertilizing varieties of butcher's broom also abound, including the extremely narrow-leaved *R. aculeatus var. angustifolius*, which reminds me of the very prickly gorse (*Ulex europaeus*).

Propagation of *Ruscus* can be done by seed or division. Sow seeds in a seedbed or container as soon as the fruits are ripe. From seed, it can take up to seven years for flowering to begin. Spring is the best time to divide plants.

While the *Ruscus* clan (with the exception of *R. hypoglossum*) has a stiff or stolid appearance, the closely related poet's laurel displays an elegant outline in the garden with its graceful, arching branches. Originally named *Ruscus racemosus*—but now recognized as the lone member of its very own genus—*Danae racemosa* bears long, slender, spine-free evergreen cladodes and grows up to three feet tall and four feet wide.

Danae doesn't produce flowers on its cladode surfaces, but rather on short racemes at the end of the stems. These develop into clusters of orange-red berries in fall. Other common names include Alexandrian laurel (Alexander the Great also would have used a laurel crown on occasion) and Italian laurel (a reference to its popularity in the Italian floral trade). Native to Iran and the Caucasus region, poet's laurel grows alongside *Ruscus* in the main, central bed of the Witt Winter Garden.

Fun with Botanical Latin

The origin of the name "Ruscus" is unclear. It may have been the name given to the plant by the Roman poet Virgil, or it may have had Anglo-Saxon roots. The derivation of the other genus names in this group are obvious, however: In Greek mythology, Danae was the mother of the hero Perseus, and Semele was the mother of Dionysus. The species names are more mundane, but they can tell us something about the key features of these plants.

Aculeatus: Meaning "spiny" or "thorny," a reference to the prickly tips of the cladodes of this species.

Androgyna: Meaning "male-female," a reference to the monoecious nature of the climbing butcher's broom. That is, it carries male and female flowers on the same plant.

Hypoglossum: From the Greek, it translates to "under the tongue," a reference to the position of the flowers and fruits underneath the true leaf on the cladode. Similarly, *hypophyllum* translates to "under the leaf."

Racemosa: Latin for "full of clusters," a reference to the fall fruit clusters of *Danae*.

There's even a climbing butcher's broom, *Semele androgyna*. Another close relative or *Ruscus* (originally put in that genus by Linnaeus but later given its own), it hails from southern Europe, North Africa and the Canary Islands. Unlike with *Ruscus* and *Danae*, the flowers and fruits of *Semele* are produced on the cladode margins. Not hardy in our area, it would make a very interesting conservatory plant.

As a group, *Ruscus* and *Danae* are well suited for that toughest of gardening conditions: dry shade. They will tolerate full sun, given adequate moisture, and are adaptable to most soils. Most of the species are also deer resistant and hardy to USDA Zone 7. (*Ruscus hypophyllum* will survive in our Zone 8, but may suffer foliar damage during a hard freeze.) Their cheery red fruits light up the late-season garden, and their cut stems can be added to festive tables as decorations in their own right. Or you can mix them into bouquets with other fruits and pods, such as those of Gladwyn iris and peony.

One warning: all of these plants are slow growing. But be patient! You won't regret it.

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FACING PAGE TOP LEFT: *Ruscus hypophyllum* in flower. (Photo by Pixeltoo/Wikimedia Commons)

TOP RIGHT: *Ruscus* x *microglossus* (probably) in the Winter Garden at the Arboretum. (Photo by Niall Dunne)

BOTTOM RIGHT: *Danae racemosa*, a close relative to *Ruscus*, in fruit in the Winter Garden. (Photo by Niall Dunne)

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Q&A from the Miller Library's Plant Answer Line

Eve Ate the Apple...or the Fig... or the Pomegranate...

PLANT SELECTION FOR A BIBLICAL GARDEN

By Rebecca Alexander

This regular column features Q&A selected and adapted from the Elisabeth C. Miller Library's Plant Answer Line program. If you'd like to ask a plant or gardening question of your own, please call (206) 897-5268 (UW Plant), send it via the library website (www.millerlibrary.org), or email directly to hortlib@uw.edu.

QUESTION

I want to design a biblical garden. Can you offer guidance on plant selection? It's unclear exactly which plants the Old Testament is describing. Plants I am considering are apple (Tree of Knowledge), burning bush (*Rubus sanctus*, which I saw growing in St. Catherine's Monastery, at the foot of Mount Sinai), the Seven Species (wheat, barley, grape, fig, pomegranate, olive and date—mentioned in the Book of Deuteronomy as the main foods eaten by the Jewish people), rose of Sharon, acacia, and anything else appropriate that will fit the space and climate limitations.

ANSWER

"Anyone delving even very superficially into the literature of the Bible plants will be impressed at once by the amazing discrepancies, contradictions, palpable misidentifications, erroneous statements, and general confusion which exist there."

This quotation from Harold Moldenke's "Plants of the Bible" is an excellent reminder of the many barriers to knowing precisely which plant species are being discussed in the ancient text. In the beginning, there was no science of botany, and the various authors were not natural historians. Biblical text is an outgrowth of oral traditions passed down over many generations, perhaps as songs or poems. There have been many editions, revisions and translations of the original text. What most English speakers know best is the King James version, and most English translations project a European identity onto biblical plants, or use multiple terms for a single plant. They are works of literature, not science.

As long as you do not expect precise botanical authenticity for each plant added to the garden, you can select among those Mediterranean plants that will thrive in our region, and that have at least an association to plants mentioned in the Hebrew Bible. If you are designing a garden for your own enjoyment, you can set any criteria you wish for the plants to include. If you are designing the garden for someone else, it would be a good idea to agree upon criteria for inclusion. For example, the Biblical Garden at Temple Beth-El in Providence, Rhode Island uses these guidelines, which allow some flexibility:

- historical accuracy (such as the Seven Species named in Deuteronomy)
- plants that belong to genera found in Israel and its environs
- plants that are evocative (by their names or appearance) of events in the Bible (Temple Beth-El's "burning bush" is represented by *Cotinus*—smoke tree—and *Spiraea* 'Gold Flame')
- presence in the garden prior its renovation in 2002

The apple, often represented in Western European translations and iconography as the fruit of the "Tree of Knowledge of Good and

The Rodef Shalom Biblical Botanical Garden, in Pittsburgh, Pennsylvania. (Photo by Daderot/Wikimedia Commons)

Evil," exemplifies the problematic nature of trying to identify plants mentioned in the Bible. It is unlikely that this fruit would have been an apple, as the Hebrew word for apple does not appear in Genesis. (It is in the Song of Songs and elsewhere.) It is likely that the apple was chosen based on a misunderstanding—or a sly play-on-words—arising from the similarity between the Latin words for evil (*malum*) and apple (*malus*). Many have theorized about the identity of that tempting fruit, with speculations encompassing wheat, grapes, pomegranate, and fig. It would serve poetic justice if the fruit were the fig, because knowledge leads Adam and Eve to cover their nakedness with fig leaves (Genesis 3:7).

The burning bush appears in chapter 3 of Exodus, but is probably not *Rubus sanctus*. It is more likely to be *Senna alexandrina*, a low-growing shrub in the bean family with big, bright-yellow flowers and yellow-brown seedpods. The Hebrew word used in Exodus is *sneh*, which is the same as the Arabic word for the *Senna* plant. In his book "Plants of the Bible," Michael Zohary says "the plant in question, specifically named 'sneh,' might well have been a real plant in the local flora. As there is no hint in the text that the sneh was a thorny bush, and there are no plants in Sinai or anywhere else that are not consumed when burnt, sneh may be identified *linguistically only* [emphasis mine]." He suggests that the plant may have been *Cassia senna*, now renamed *Senna alexandrina*.

There is no native *Rubus* in Sinai, Egypt or southern Israel. The bramble in the monastery garden at Santa Caterina is a cultivated specimen planted by the monks, Zohary argues, "to strengthen the belief that the 'burning bush' has grown there since the revelation, so completely is sneh equated with brambles in the minds of scholars and Bible lovers."

The species *Senna alexandrina* may be a bit difficult to obtain in the greater Seattle area and might not do well in our climate. However, other species of *Senna* are more widely available. If you wish to grow the *Rubus* you saw (also referred to as *Rubus ulmifolius* ssp. *sanctus* and *Rubus sanguineus*)

Sea daffodil, *Pancratium maritimum*, a more likely candidate for rose of Sharon than the Asian *Hibiscus syriacus*. (Photo by Zvika/Wikimedia Commons)

as a keepsake from your trip to the monastery, you should go ahead. It is not easy to obtain, except as seeds, and it prefers a moist environment. Neither *Rubus* nor *Senna* is fireproof, so if you are seeking a plant that appears to burn without being consumed, the search continues! Arguably, both plants have a somewhat "fiery" appearance (*Rubus sanctus* bears pink flowers, and its fruits are red while ripening), but perhaps the flames are metaphorical. The scene is one of divine revelation, so even some kind of desert-induced mirage is a possibility.

Rose of Sharon, in the realm of English common names, refers to *Hibiscus syriacus*, a lovely flowering shrub that will do well in the Seattle area. However, *H. syriacus* is not native to the coastal plain of Sharon in Israel. (It's actually from East Asia!) The biblical source is chapter 2 of the Song of Songs, and here the Hebrew name is *havatzelet ha-Sharon*, which is currently used to refer to two native bulbous plants in the family Amaryllidaceae, *Pancratium maritimum* and *Vagaria parviflora*. But English-speaking gardeners are unlikely to associate rose of Sharon with a lily-like plant—and this is the perpetual dilemma with ancient texts that have been translated in various ways over time, and were written before anyone had devised a system of plant taxonomy.

Acacia appears in the book of Exodus numerous times. The Hebrew name is *shitta* (singular) or *shittim* (plural). According to the text, acacia wood was the raw material for the Tabernacle and its contents, including the Ark of the Covenant. Biblical botany scholar Lytton Musselman speculates in his book "Figs, Dates, Laurel, and Myrrh" that the species might have been *Acacia albida*, now renamed *Faidherbia albida*. I suggest skipping this plant (and all acacia) because it is only marginally hardy in our area. According to local tree expert Arthur Lee Jacobson, most gardeners who plant *Acacia* end up with a large pile of exotic firewood, once the trees have died off during a serious winter.

Most of the Seven Species plants will grow here, except for date palm (*Phoenix dactylifera*). Instead, you could plant a hardy palm species, such as windmill palm (*Trachycarpus fortunei*) or European fan palm (*Chamaerops humilis*). I would not expect reliable fruit from olives or pomegranates here, though they do sometimes develop over a warm summer. Plant these trees in a sunny spot with good drainage. *Olea europaea* 'Arbequina' is the olive variety most likely to produce fruit here.

The Hebrew bible makes frequent use of hendiadys—a rhetorical flourish, in which two words linked by "and" express a single concept—and this further complicates questions about plant names. For example, there are many words for thorns (just as there are indeed many thorny plants in the region), but the names are

The "burning bush" *Senna alexandrina*. (Photo by Karel Jakubec/Wikimedia Commons)

Rose of Sharon *Hibiscus syriacus*. (Photo by Chrumps/Wikimedia Commons)

Saffron crocus, *Crocus sativus*. (Photo by Liné1/Wikimedia Commons)

often paired, such as *kotz ve-dardar*. Both words mean a type of thorn, but it would be pointless to try to determine which genus and species were intended.

To avoid planting invasive thistles with vicious thorns, consider using *Echinops*, *Eryngium* and non-weedy *Centaurea* to represent thorny plants. For color interest, you could add "flowers of the field" from Isaiah—a red poppy such as *Papaver rhoeas*; *Lilium candidum*, *Narcissus tazetta* or *Pancratium maritimum* to represent the various biblical lilies, such as *shoshan* and *havatzelet*; and *Crocus sativus* (saffron), mentioned in Song of Songs.

In a public garden, signage that explains the biblical resonance of specific plants growing in the garden will provide context and make the experience meaningful for visitors. There are more than 100 different plants named in the Hebrew Bible, and whatever you choose to plant in your biblical garden, you will be joining a centuries-old and ongoing community of commentators and interpreters who have derived inspiration from the ancient text.

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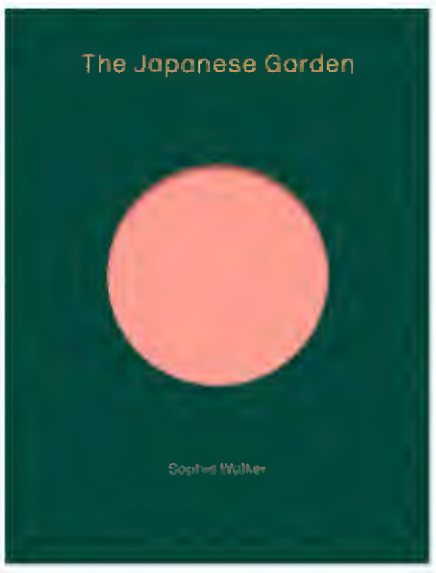
In a Garden Library

New Books for Pacific Northwest Gardeners

By Brian R. Thompson

Japanese-Style Gardens—Today

Sophie Walker trained as a garden designer in Britain, displaying her skills to acclaim at the epitome of English gardening institutions: the Chelsea Flower Show. To broaden her design skills, she studied Japanese-style gardening. She describes her new book, "The Japanese Garden," as essentially a workbook of those studies.



The author presents a series of chapters on different themes, interspersed with short, guest essays by noted artists, architects, and other cultural figures. Topics vary widely, from the tenets of Buddhism as they apply to gardens to the use of courtyard gardens to favorite flowers and trees. Our relationship with nature, as expressed in gardens is an overarching theme. Concluding each chapter are photographs of gardens that embody concepts Walker presents.

Throughout, she looks for connections or contrasts with Western (European and American) traditions, and she examines how icons of Western design or art have been influenced by Japanese traditions—including Frank Lloyd Wright, Claude Monet and, in present day, David Hockney. One contrast she observes is when "visiting a Western cultural landmark—a palace or cathedral—cultural and historic context is unavoidable. But in the Japanese garden, context is deliberately confused, as is scale."

In "Visionary Landscapes," Kendall Brown profiles the lives and gardens of five designers born in the mid-20th century—three in Japan, two in the United States—who have practiced their craft primarily in North America. The new gardens they have designed, mostly in the last 30 years, are pushing the evolving concept of Japanese-style gardening.

One of the designers, Hoichi Kurisu, is perhaps best known regionally as the curator of the Japanese Garden in Portland from 1968–1972. After he left the garden, he stayed in Portland, and his company has thrived in designing, building, and maintaining mostly residential gardens in that area. He has also inspired gardens throughout the country.

A couple of years ago, I was fortunate to hear David Slawson (another of the profiled designers) speak at the Cleveland Botanical Garden, and to see the garden he designed there. Brown describes Slawson's gardens as presenting "a greater awareness of regional landscape gained from having seen it beautifully manifest in microcosm."

The examples in this book show that the expressions of traditional Japanese garden

design are subtle, but also adaptable, even for gardeners who live in regions where few Japanese plants thrive. For example, after listening to the Slawson talk, a librarian colleague of mine was excited that she could incorporate his ideas to her home desert garden in Phoenix, Arizona.

Japanese-Style Gardens—In History

Wybe Kuitert has written two deeply researched books on the history of Japanese gardens. The first, "Themes in the History of Japanese Garden Art" (2nd edition, 2002), roughly spans the years 900 to 1650 CE. It concluded in the mid-17th century, when Kuitert writes, "the practice and theory of garden art became established in a way that does not differ much from our own days."

Kuitert's new book, "Japanese Gardens and Landscapes, 1650–1950," brings that history up to near present day. Despite his conclusion in the earlier book, I found the history of the recent centuries surprisingly dynamic. During the Edo period (1603–1868), gardens of the "daimyo," or regional rulers, became quite fanciful. "These were Disney-type re-creations that functioned primarily as leisure environments."

This was also a time when variegated plants and flowers with unusual and flamboyant forms became popular. As printing techniques became more widely and cheaply available, there was an explosion of published gardening books, codifying some of the earlier customs, but with a loss of their symbolism. Kuitert laments this, describing these books as only a "crowd-pleasing version of garden traditions and ideas."

After Japan opened to the West in the mid-1800s, there was much upheaval in all ways of life, including gardening. Western-style gardens appeared, and Japanese garden designers who studied in the West were in high demand.

For local readers, this book's profile of Juki Iida (1889/90–1977)—the principal designer of the Seattle Japanese Garden—will be of great interest. Kuitert reviews Iida's early training and his developing understanding that there exist two kinds of Japanese garden: the formal, built garden and the naturalistic garden. For his emphasis of the latter style, Iida is credited by Kuitert as "a key figure in democratizing the long tradition of garden-making in Japan," and for making individual gardens more accessible to everyone.

Ornamental Cherry Trees

In addition to his history books, Wybe Kuitert also wrote "Japanese Flowering Cherries" (1999). Douglas Justice, of the University of British Columbia, refers to this earlier book in his "Ornamental Cherries in Vancouver." Originally published by the Vancouver Cherry Blossom Festival in 2008, this excellent guide celebrates a rich collection of urban flowering cherries—some 40,000 trees altogether.

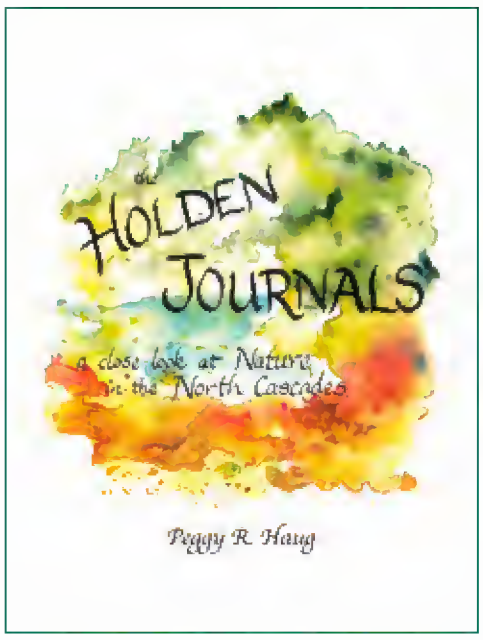
The book profiles 35 different flowering cherry cultivars found in the city and features photographs of each tree in the landscape, as well as close-ups of the flowers. Justice describes the foliage of each tree as it emerges in spring, appears in the full leaf of summer, and colors in the fall. Sadly, this book is hard to obtain and is not available to borrow and take with you on a stroll in the Arboretum next spring to see our own wonderful collection of cherries. (We are still hoping to add the 2014 edition to the Miller Library.)

However, you're more than welcome to visit the library and enjoy the book here. You'll learn a lot about cherries, including Yoshino cherry (*Prunus* × *yedoensis* 'Somei-yoshino')—a cultivar of uncertain origin, but famous from the Hanami (cherry viewing) festivals in Japan. Yoshino is also the cherry of the Tidal Basin in Washington, D. C., and at "The Quad" on the University of

Washington campus. Another widely planted selection is the Kanzan or Kwanzan cherry (*Prunus* Sato-zakura Group 'Kanzan'), perhaps because the "apparent good health of this cultivar often borders on the miraculous."

Nature Journal in the Cascades

Holden Village is a Lutheran community center deep in the Cascade Mountains, accessible only by a boat ride on Lake Chelan, followed by a bus ride on a mountain road. At 3000 feet, it is very cold and snowy in the winter, and cut off from Wi-Fi and cell phone reception.



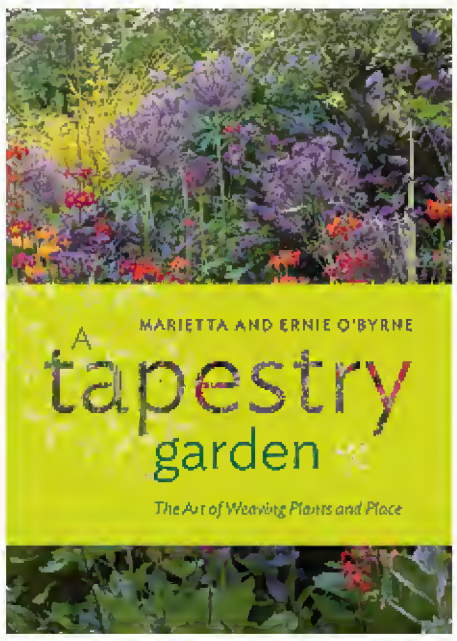
For some this may sound like paradise. It was for artist Peggy Haug and her partner (now spouse), Juanita, who spent two years there from 2005–2007. "Holden Journals: A Close Look at Nature in the North Cascades" is Haug's record of the flowers and the birds she found in the village and on nearby hikes. Her drawings are augmented with copious notes of interpretation, bits of poetry, and her impressions of living in an isolated village.

This book is also an excellent field guide to the wildflowers, trees and shrubs of this region and contains an impressive birding list—68 species in the first year. Some of the most beautiful drawings are of the colorful leaves and berries of fall, intricately overlapping. It can take several delightful minutes just to read all the notes that Haug weaves in amongst the plant images.

While native plants are its main botanical features, Holden Village has surviving plant relics from a nearby former mining village, including daffodils and bearded iris. The latter were captured in an earlier book, "Holden Village Historic Iris," reviewed in the Fall 2008 issue of the "Bulletin."

A Pacific Northwest Garden Treasure

Marietta and Ernie O'Byrne are very clear about their gardening goals. They are not interested in low-maintenance gardening "with orderly shrubs, surrounded by chipped mulch, and plants that don't touch," but neither do they care for plant thugs that dominate their floral neighbors. To achieve their goals, much maintenance is required, and they relish the work. "A Tapestry Garden: The Art of Weaving Plants and Place" captures the O'Byrne philosophy as expressed in the two acres of gardens they've created on their farm in Eugene, Oregon.



The O'Byrnes are famous for their hellebores, so I wasn't surprised to read about their woodland gardens filled with shade-loving favorites, such as trilliums, arisaemas and podophyllum. But I didn't know they had large swaths of sun-loving plants, too. These include a riotous summer perennial border (a "full-flowered buxomness of leaning, mingling, sprawling growth") and a chaparral garden that recreates the look of the Southwest, albeit with plants that can survive a Pacific Northwest wet winter and spring.

In reading the chapter about the latter garden, I was reminded of the works by Beth Chatto, especially "The Gravel Garden" (2000), one of my favorite all-time gardening books. The O'Byrnes are not afraid to experiment. The writing (primarily in Marietta's voice) recounts all the successes and failures in a matter-of-fact way and quietly expounds their right-place, right-plant philosophy throughout their several garden settings and microclimates.

Both Marietta and Ernie grew up loving nature. Both had college degrees in biology and worked together in their own landscape-management company for much of their careers,

but when it came to their own garden, they made plenty of horticultural mistakes, especially in the early years. While this at first seems like a book for the gardening elite, I encourage beginners to give it a read. You will be amused by the authors' misfortunes and encouraged to shrug off your own failures and try again.

As they spent more and more time in their own garden, the authors eventually curtailed some of the maintenance business to start their own nursery. The nursery continues today as a wholesale business exclusively selling hellebores. One chapter of the book highlights the beauties they have developed, especially the Winter Jewels series, with stunning photographs. This book also includes a very helpful chapter on the O'Byrnes' maintenance practices, as well as maps of the garden inside both covers, in case you get lost during the written tour.

The O'Byrnes even sleep in their garden, enjoying the night fragrances of their summer, sunny perennials and the hummingbirds and other pollinators that are on the wing at first light. Their plant palette is very broad and includes many natives, but also challenging-to-grow plants from around the world. Many of these are grown from seed, since often there is no other way to obtain them. Marietta and Ernie have decided "harmonious chaos is possible in a garden, with denizens from multitudes of countries of origin. Would that we humans could be as comradely as is the diverse plant world here represented."

Brian R. Thompson is the manager and curator of the Elisabeth C. Miller Library of the University of Washington Botanic Gardens. He is also a member of the "Bulletin" Editorial Board.

The Science of Gardening

Linda Chalker-Scott has written several books available at the Miller Library—all of them intended to help the home gardener make more savvy choices and dispel many gardening myths that do not stand up to the rigor of scientific review. Now she brings the same messages to a new format. "The Science of Gardening" is a set of four DVDs that contains 24 lessons, each 30 minutes in length.

These cover the whole range of gardening culture and techniques—almost everything except an A–Z encyclopedia of recommended plants. The emphasis is on woody plants and includes considerable detail on growth processes and the ecology of your garden.

A book accompanies the set. It follows the same lesson plans and even includes some questions or projects for you as the student. I didn't watch all of the lessons on the DVD, but in comparing a few to the book, they are similar. However, I think the visual presentation is richer—as Chalker-Scott is a skilled teacher and presenter, and she capably incorporates graphics and video examples to augment her well-researched viewpoints.

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